

REMARKS

The application has been amended and is believed to be in condition for allowance.

Claims 1-12 remain in this application. Claims 6-7 and 19-20 are canceled.

Claim 1 has been amended to obviate the Official Action's rejection under 35 USC 112, second paragraph, as stated below. Claim 11 has been amended as to form. The amendments are non-substantive and introduce no new matter.

New claims 23 and 24 each depend from claim 1 and further claim the elected invention. The new claims find support in the specification and the figures as filed (e.g. page 9, lines 18-19; see also the FEPA standard 42-GB-1984).

An appendix describing FEPA standard 42-GB-1984 is attached to this amendment for the Examiner's convenience.

New claim 25 is independent and corresponds to a combination of claim 1 with a part of claim 11. The new claim finds support in the specification and the figures as filed and introduces no new matter. Claim 25 is believed to be patentable for reasons stated below.

The Official Action rejected claims 1-9 under 35 USC 112, second paragraph, as being indefinite.

The Official Action states that Applicant's use of the FEPA 42-GB-1984 standard in the claims is improper as being ambiguous because the standard is subject to change or update.

The Official Action suggests that a proper way of defining the grit size of the crystals would be through grain size given in microns.

Applicant respectfully disagrees. The reference to "FEPA Standard 42-GB-1984" is not ambiguous because it unambiguously designates a specific standard relative to grain size distribution. If the standard is updated, the updated standard would receive a new designation to distinguish it from the standard it improves upon; the reference "FEPA Standard 42-GB-1984" would still unambiguously refer to the same standard it did before any update took place.

It is also respectfully submitted that the definition of a grit according to this standard, particularly a grit size, is too complex to be adequately recited without making reference to a standard such as the FEPA standard or else including a table of particularities as in new claims 24 and 26. A document describing the FEPA standard is appended to this amendment for the Examiner's convenience. Further, it is Applicant's understanding that the use of FEPA standards in claims have been accepted by the Patent Office in the past (see, for example, U.S. Patent No. 7,011,689).

It is also noted that the grit size describes the grains and not crystals, wherein the smaller the value of the grit value, the coarser the grains (e.g., page 9, lines 14-15 of the present specification). For example, in Table 1 of column 5

of NIKITINA, the third column refers to crystal sizes, not the sizes of the grains accorded to grit size.

Claim 1 has been amended to remove the recitation relating to the FEPA Standard. Accordingly, it is respectfully submitted that claim 1 as amended avoids the Official Action's rejection under 35 USC 112, second paragraph. Reconsideration and withdrawal of the rejection of claims 1-9 under 35 USC 112, second paragraph are respectfully requested.

New claims 23 and 24 depend from claim 1 and are believed patentable over the 35 USC 112 rejection for the reasons stated above. Allowance of the claims as submitted is earnestly solicited.

The Official Action rejected claims 1-5, 8-9, and 12 under 35 USC 102(b) as being anticipated by Nikitina et al. (U.S. 4,906,2551; hereinafter NIKITINA).

The Official Action rejected claims 10-11 under 35 U.S.C. 103(a) as being unpatentable over NIKITINA.

The rejections are respectfully traversed by at least the reasons that follow.

As to claim 1, the Official Action states that NIKITINA is drawn to an abrasive material comprising corundum crystals surrounded by an additive that can be spinel. The Official Action refers to column 5, Table 1, composition 10 of the reference, and concludes that composition 10 is equivalent to 2.27-2.83wt% MgO,

with the balance being Al_2O_3 , thereby anticipating the compositions of claims 1-5.

The Official Action concedes that no minimum silica content is taught by NIKITINA, nor is the inclusion of silica or any other component besides alumina and magnesia taught.

The Official Action seems to reason that silica and other components besides alumina and magnesia are impurities that would have been known in the art to be minimized. The Official Action makes reference to the specification of the instant invention, page 4, lines 20-26. The Official Action concludes that one of ordinary skill in the art would have known to keep impurities to a minimum, and states the lack of explicit impurities limits in NIKITINA does not preclude anticipation.

Applicant respectfully disagrees. It is respectfully submitted that NIKITINA fails to describe, at least, fused ceramic grains wherein the maximum carbon content is 200 ppm, as required by claim 1.

The recitation of the maximum carbon content reflects the oxidation-reduction state (see specification of the instant invention, e.g. page 5, line 26). Here, carbon content corresponds to reducing conditions during the fusion step (page 3, lines 21-24), wherein the maximum carbon content less than 200 ppm corresponds to strong reducing conditions. NIKITINA does not teach or suggest such reducing conditions.

Therefore, it is respectfully submitted that NIKITINA does not teach the recitation of a maximum carbon content being 200 ppm, as required by claim 1.

It is also respectfully submitted that NIKITINA does not teach the recitations of SiO_2 less than 0.1% and other impurities less than 0.4%.

As stated above, the Official Action contends that one of ordinary skill in the art would have known to keep impurities to a minimum, therefore the lack of explicit impurities limits in NIKITINA does not preclude anticipation.

On the contrary, NIKITINA teaches it is advantageous to add "one or more oxides from the group MgO, SiO , CaO , for example magnesium silicate, calcium silicate, or pure oxides," (column 4, lines 26-34). The addition of silicon oxides, to which silica belongs, and other "impurities" are thus described as advantageous in NIKITINA.

Therefore, it is respectfully submitted that NIKITINA does not teach keeping impurities to a minimum, and in any case, does not teach fused ceramic grains of SiO_2 less than 0.1% and other impurities less than 0.4%, as recited in claim 1.

Accordingly, it is respectfully submitted that NIKITINA does not teach all the recitations of claim 1, and therefore does not anticipate the invention as recited in claim 1.

Moreover, it is respectfully submitted that NIKITINA teaches away from composition 10 of column 5, Table 1. With

additional content more than 7.5% by mass, as in compositions 5, 10, and 15 of Table 1, the abrasiveness of the abrasive grain decreases significantly due to the decreasing of the amount of the most hard phase (corundum) in the grain (column 4, lines 21-24; column 5 line 65 to column 6 line 66).

For all the foregoing, it is respectfully submitted that NIKITINA does not anticipate the recitations of claim 1, and therefore claim 1 and all claims depending therefrom are patentable. Reconsideration and withdrawal of the rejection are respectfully requested.

It is further respectfully submitted NIKITINA does not teach fused ceramic grains which consist of corundum crystals surrounded by a nonstoichiometric $\text{MgO-Al}_2\text{O}_3$ spinel phase, as required by claim 9.

As to claim 9, the Official Action states that NIKITINA teaches corundum crystals surrounded by spinel phase, but is silent as to the stoichiometry or nonstoichiometry of the spinel phase. The Official Action states that it is the position of the Examiner that the spinel in the material taught by NIKITINA would inherently be at least partially nonstoichiometric.

Applicant respectfully disagrees. NIKITINA specifies that the magnesium oxide is added into the mixture based on a stoichiometric ratio (column 4, lines 38-42). Applicant fails to find any teaching or suggestion of nonstoichiometry in NIKITINA.

Accordingly, it is respectfully submitted that NIKITINA does not teach a nonstoichiometric $\text{MgO-Al}_2\text{O}_3$ spinel phase, as required by claim 9, and therefore claim 9 and claims depending therefrom are patentable. Reconsideration and withdrawal of the rejection are respectfully requested.

It is also respectfully submitted NIKITINA does not teach or suggest fused ceramic grains comprising corundum crystals 90% of which having a size of less than 27 μm , as required by new independent claim 25.

On the contrary, NIKITINA discloses materials made of corundum and spinel each with corundum crystal sizes of at least 240 μm (e.g., column 5, Table 1, compositions 6-10). Further, NIKITINA teaches that the compositions in which the corundum crystal size is the lowest (e.g., composition 10) provide the poorest single grain strength (column 5, Table 1, compositions 6-10), thereby teaching one skilled in the art away from said compositions.

Accordingly, it is respectfully submitted that claim 25 is patentable as presented. Allowance of the claim is earnestly solicited.

From the foregoing, it will be apparent that applicants have fully responded to the October 31, 2007 Official Action and that the claims as presented are patentable. In view of this, applicants respectfully request reconsideration of the claims, as presented, and their early passage to issue.

In order to expedite the prosecution of this case, it is requested that the Examiner telephone the attorney for applicants at the number set forth below if the Examiner is of the opinion that further discussion of this case would be helpful.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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APPENDIX:

The Appendix includes the following item(s):

- ☒ "Bonded Abrasive Grain Sized Standard",
FEPA-Standard 42-GB-1984, R 1993